

Algae: A complex and diverse group of organisms that are, for the most part, aquatic organisms that obtain energy through photosynthesis and are smaller and less complex than land plants. Algae include cyanobacteria, diatoms and other brown algae, red algae, green algae, glaucophytes, euglenophytes, cryptophytes, haptophytes, and dinoflagellates.

Algae Growth Habits (Algae Types):

Epilithic: Algae that grow on hard, relatively inert substrata, such as gravel, pebble, cobble, and boulder, that are bigger than most algae.

Epiphytic: Algae that grow on plants and larger algae, which provide relatively firm substrata that are bigger than the epiphytic algae, but can be highly active metabolically and a great source of nutrients.

Epipsammic: Algae that grow on sand, which is hard, relatively inert, and has relatively little surface area. Few algae live in sand among sand grains, because the sand is too unstable and may crush them.

Epipellic: Algae that grow on inorganic or organic sediments that are smaller than most unicellular algae. Epipellic algae are typically large motile diatoms, motile filamentous blue-green algae, or larger motile flagellates like *Euglena*.

Phytoplankton: Microscopic algae that are suspended in the water column.

Aquatic Benthic Macroinvertebrates: Aquatic animals without backbones that can be seen by the unaided eye and typically dwell on the bottom substrate of a waterbody (e.g., rocks, logs, sediment, plants). Examples of aquatic macroinvertebrates include aquatic insects (such as mayfly, dragonfly and caddis fly larvae), aquatic worms, amphipods (scuds), leeches, clams and snails.

Aquatic life: Any plants or animals that live at least part of their life cycle in fresh water.

Aquatic Life Uses (ALUs): The U.S. Clean Water Act requires that waters of the U.S., at a minimum, are managed to attain an Interim Goal condition that provides for “protection and propagation of a balanced population of fish, shellfish and other aquatic life” (sometimes referred to as “fishable/swimmable”). Aquatic life uses establish the goal conditions for aquatic life and are a federally required feature of state Water Quality Standards.

As naturally occurs: Conditions with essentially the same physical, chemical and biological characteristics as found in situations with similar habitats, free from measurable effects of human activity.

Attainment Class: Water classification predicted by the Biological Monitoring Program’s statistical model.

Biological Criteria (Biocriteria): Numerical values or narrative expressions that describe the condition of aquatic communities and are used to determine if waterbodies are attaining biological goals as described by water classifications (e.g., Class A, Class B, Class C).

Biological Integrity: The ability of an aquatic ecosystem to support and maintain a balanced, adaptive community of organisms having a species composition, diversity, and functional organization comparable to that of natural habitats within a region. (Karr, J.R. and D.R. Dudley. 1981. Ecological perspectives on water quality goals. Environmental Management 5:55-68.)

Class A indicator species:

Brachycentrus (Trichoptera: Brachycentridae)

Serratella (Ephemeroptera: Ephemerellidae)

Leucrocota (Ephemeroptera: Heptageniidae)

Glossosoma (Trichoptera: Glossosomatidae)

Paragnetina (Plecoptera: Perlidae)

Eurylophella (Ephemeroptera: Ephemerellidae)

Psilotreta (Trichoptera: Odontoceridae)

Community function: Mechanisms of uptake, storage, and transfer of life-sustaining materials available to a biological community which determine the efficiency of use and the amount of export of the materials from the community.

Community structure: The organization of a biological community based on numbers of individuals within different taxonomic groups and the proportion each taxonomic group represents of the total community.

Concentration: The ratio of the quantity of any substance present in a sample of a given volume or a given weight compared to the volume or weight of the sample.

Designated Use: Classification designated in water quality standards for each waterbody or segment that defines the optimal purpose for that water body.

Environmental Stressor: Any physical, chemical or biological entity that can induce an adverse response. (U.S. EPA 2000. Stressor Identification Guidance Document. Office of Research and Development, Washington, DC. EPA 822-B-00-025.)

Functional Feeding Group: Aquatic invertebrates can be grouped into functional feeding groups according to how and what they eat:

Collector-filterers strain particles out of the flowing water with brushes or nets.

Collector-gatherers are opportunistic omnivores that feed on whatever is easiest to find, using a variety of feeding methods.

Parasites are organisms that live on or in another organism and obtain nourishment directly from that organism, usually without killing it.

Piercers are organisms that obtain nourishment by piercing plant or animal tissue and sucking fluids.

Predators are carnivores that hunt and eat other organisms.

Scrapers remove algae, bacteria and fungus growing on the surface of rocks, twigs and leaf debris.

Shredders chew on coarse leaves and twigs that have started to decay to obtain nourishment from associated fungi, bacteria and other organic material.

Generic Richness: The number of different genera found in all replicates from one sampling site. To view the counting rules for generic richness, please view: Davies, Susan P. and Tsomides, Leonidas. Appendix C-1, The Methods Manual For Biological Sampling and Analysis. Maine Department of Environmental Protection, August 2002.

Hilsenhoff Biotic Index (HBI): A benthic invertebrate community index developed by W.L. Hilsenhoff. The HBI is determined by assigning a pollution tolerance value for each family of benthic invertebrates, then computing the average tolerance for a sample.

Human Disturbance Score: Human Disturbance Ranking Form for Biological Assessment of Wetlands: Evaluation of the human impacts to a wetland sample locations, with five subsections of impacts (Evidence of Chemical Pollutants, Hydrologic Modifications, Impervious Surface, Non-point Sources, and Vegetative Modifications). Each subsection is scored on a scale from 0 (Not Observed) to 5 (Severe Disturbance), with a highest possible score for each site of 125.

Indigenous: Organisms supported in a reach of water or known to have been supported according to historical records compiled by State and Federal agencies or published in scientific literature.

Linear Discriminate Functions: Equations used in statistical analysis (i.e., linear discriminate model) that mathematically describe measurable characteristics of biologically different classification groups.

Milligrams per liter (mg/L) - A unit expressing the concentration of chemical constituents in solution as weight (milligrams) of solute per unit volume (liter) of water; equivalent to one part per million in most stream water and ground water.

Natural: Living in or as if in, a state of nature not measurably affected by human activity.

Nutrient and Energy Cycling: The processes that move energy and chemical nutrients (such as nitrogen) through an ecosystem. A classic example is that of energy moving up the food chain. A plant is eaten by an herbivore, who is in turn eaten by a carnivore, who then dies and releases energy and nutrients back into the ecosystem via decomposition, where they can again be used by plants.

Periphytometer: A type of device used to collect a standardized sample of periphyton. The sampling device consists of two floats that suspend a rack containing microscope slides below the water surface and parallel to water flow.

Periphyton: Microscopic algae, bacteria, and fungi that grows on the bottom substrate (e.g., rocks, logs) of a stream or river. Does not include macroscopic algae, such as *Cladophora*, *Spirogyra*, *Chara*, and *Vaucheria*. (Stevenson, R.J., M.L. Bothwell, and R.L. Lowe. 1996. *Algal Ecology: Freshwater Benthic Systems*. Academic Press; Boston.)

Relative Abundance: The mean number of individuals from one taxonomic grouping (e.g. family) or taxon divided by the total mean abundance for the whole sample.

Relative Generic Richness: The count of the different genera found in all replicates from one site divided by the generic richness.

Resident Biological Community: Aquatic life expected to exist in a habitat, which is free from the influence of the discharge of any pollutant. This shall be established by accepted biomonitoring techniques.

Richness: The number of distinct taxa (species or higher) found in an assemblage, community, or sample.

Rock Bag/Rock Basket: Rock filled mesh bag or wire basket introduced substrate.

Statutory Class: Water classification assigned by the Maine Legislature, consisting of designated uses, numeric criteria, and specific limitation on certain activities. If a water body is meeting all of its classification standards, it is attaining its class.

Taxa Code: Unique numeric identifier assigned by Biomonitoring staff to each taxa

Taxa Name: Generally accepted scientific name of taxa.

Taxonomy: The science of classifying organisms by a predetermined system. The most common system is that of Carl Linnaeus, which classifies organisms by kingdom, phylum, order, family, genus, and species, with kingdom being the broadest group and species the most specific.

Tiered Aquatic Life Uses (TALUs): A few States have established more refined *aquatic life uses* that describe, in Water Quality Standards, multiple levels or goals for aquatic life conditions. Maine has a *Tiered Aquatic Life Use* system in Water Quality Standards (Class AA, A, B or C); all TALU classes in Maine are at or above the Clean Water Act Interim Goal condition.

Total Mean Abundance: The count of all individuals in all replicate samples from one site, divided by the number of replicates, to yield mean number of individuals per sample. (Davies, Susan P. and Tsomides, Leonidas. 2002. Appendix C-1, Methods for Biological Sampling and Analysis of Maine's Rivers and Streams. Maine Department of Environmental Protection, DEP LW0387-B2002

Unimpaired: Without a diminished capacity to support aquatic life.

Water Column: The water in any waterbody from the surface down to the substrate.

Without detrimental changes in the resident biological community: A community with no significant loss of species or excessive dominance by any species or group of species attributable to human activity.

Zooplankton: Small, sometimes microscopic animals that live suspended in the water column.